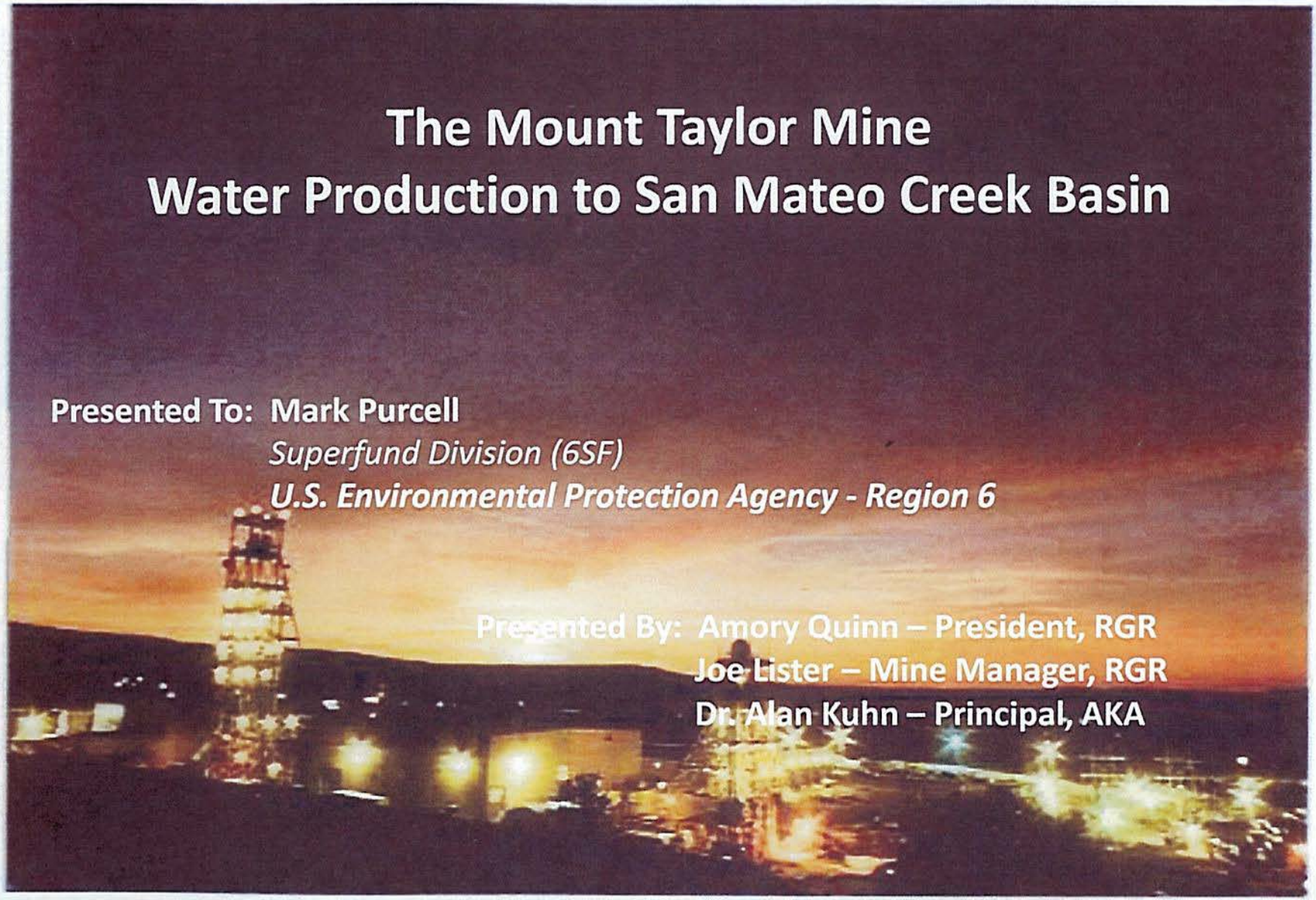
The Mount Taylor Mine
Water Production to San Mateo Creek Basin



Presented To: Mark Purcell
Superfund Division (6SF)
U.S. Environmental Protection Agency - Region 6

Presented By: Amory Quinn – President, RGR
Joe Lister – Mine Manager, RGR
Dr. Alan Kuhn – Principal, AKA

Presentation Date: March 26th, 2019

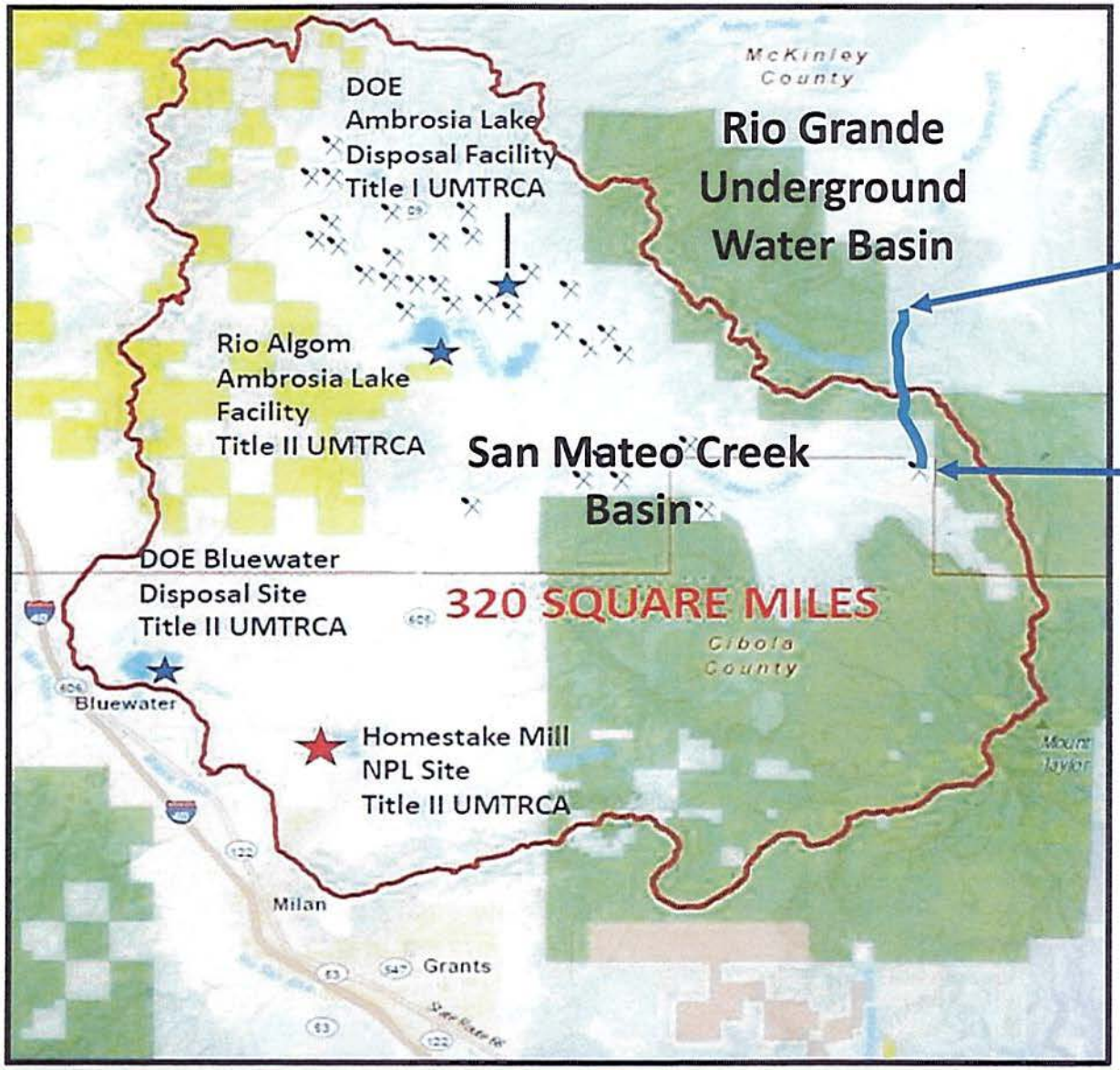
RIO GRANDE RESOURCES CORPORATION

9819214

SUMMARY

- The Mount Taylor Mine only discharged water to San Mateo Creek Basin during dewatering/shafts sinking (December 1976 – February 1978) under EPA/NPDES Permit #NM0028100 and State Discharge Permit DP-61.
    - Permit limits on Uranium were 2ppm (daily avg.) and 4ppm (daily max.)
    - Permit limits on Radium were 30pCi/l (daily max.)
    - MTM Discharge stayed within limits
- All water discharged in San Mateo Creek Basin met EPA/NMED current drinking water human health standards.
- Total water discharged from Mount Taylor Mine to SMCB is miniscule, approximately 0.5% of all water discharged from 1956 – 1982.
- Mount Taylor Mine is located more than five miles east (up-gradient) of the nearest point of ground water contamination.
- EPA background wells (BG-3, BG-4, and BG-5) located less than one mile down-gradient from the Mount Taylor Mine show no exceedances of drinking water quality standards.

Location of San Mateo Creek Basin and Rio Grande Underground Water Basin

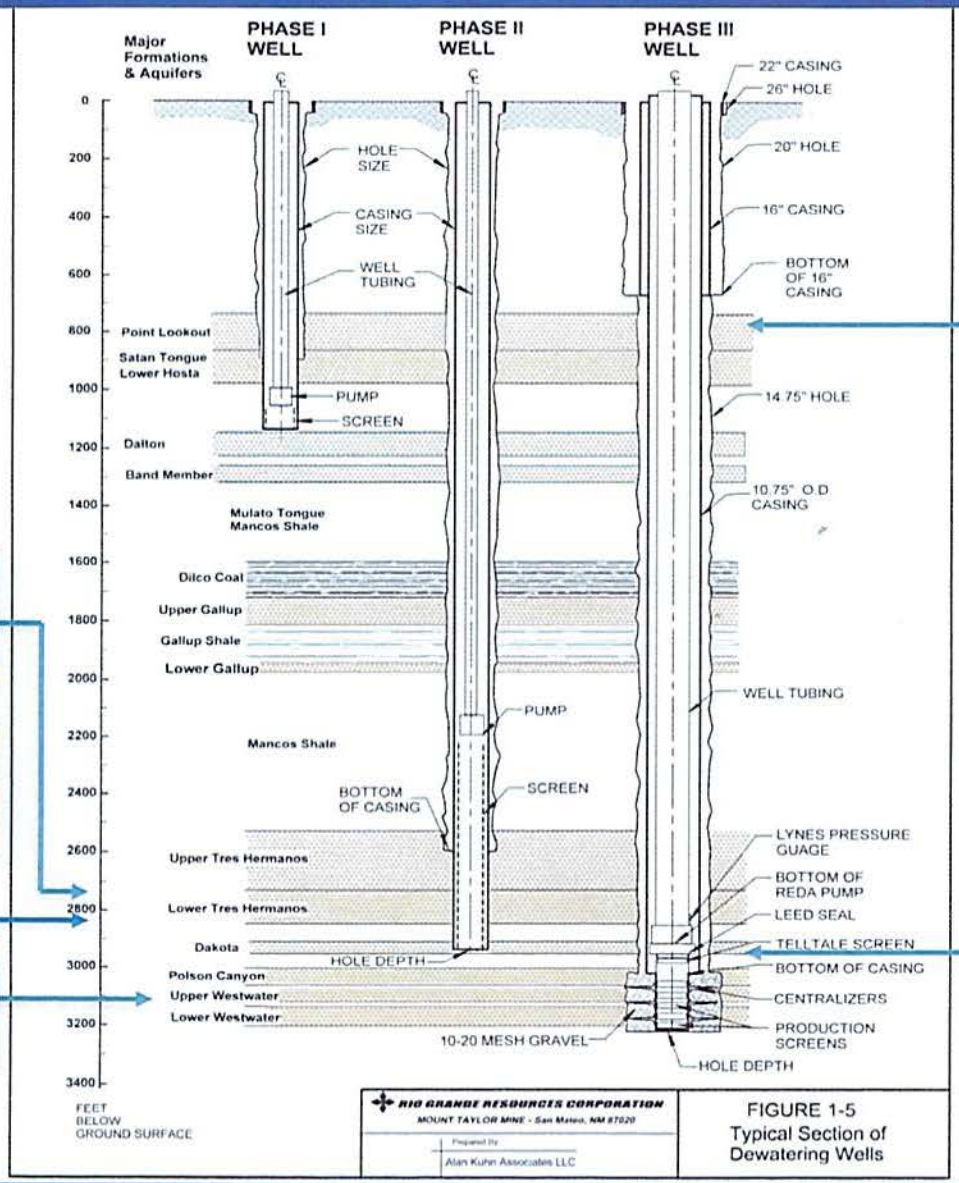


Mt Taylor Mine Water Discharge Pipeline after 2/23/78 per NPDES Permit #NM0028100 and NM Permit DP-61

Mt Taylor Mine

Based on Slide 3, San Mateo Creek Basin Ground Water Study, Superfund National Radiation Training Workshop, EPA, April 5, 2018. Basin labels added.

Mt Taylor Mine Dewatering Wells



Pt. Lookout Aquifer
(no treatment needed)

Bottom of 24' shaft on 2/23/78

Bottom of 14' shaft on 2/23/78

Dakota Aquifer
(no treatment needed)

Westwater Aquifer
(treatment needed)

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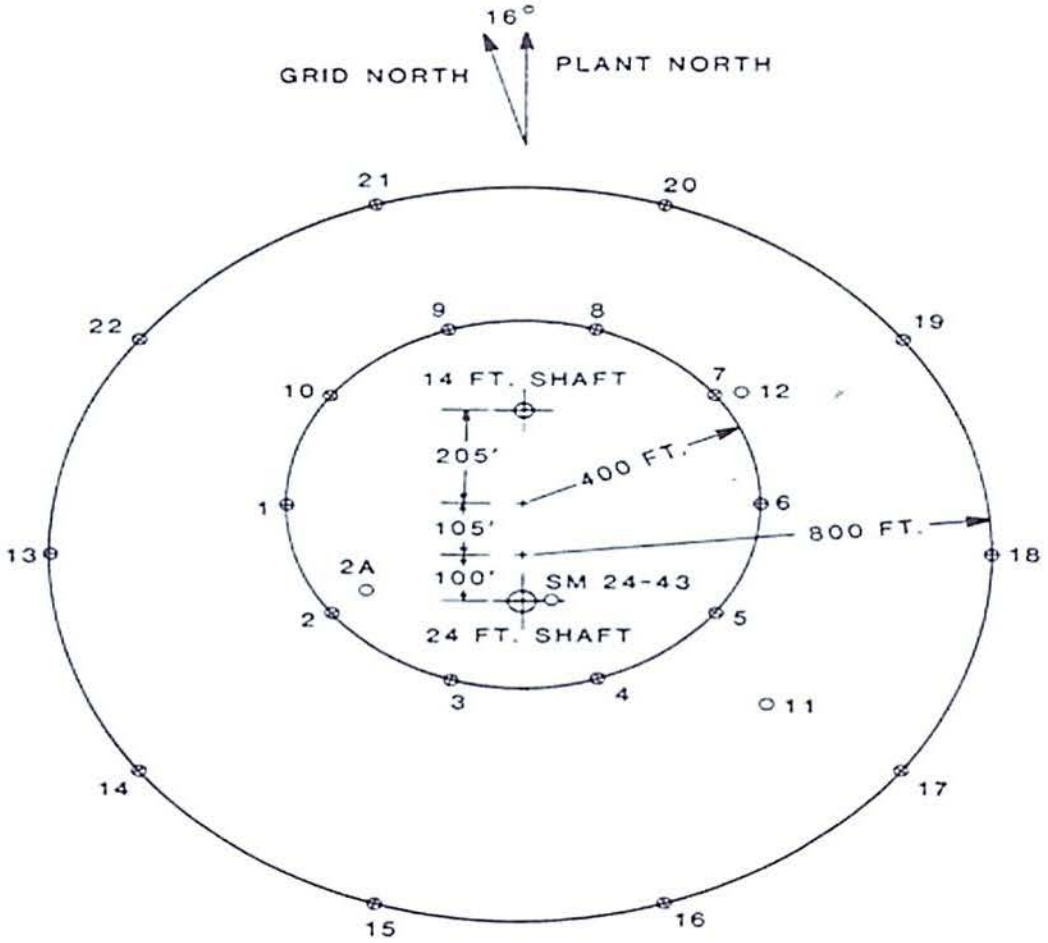
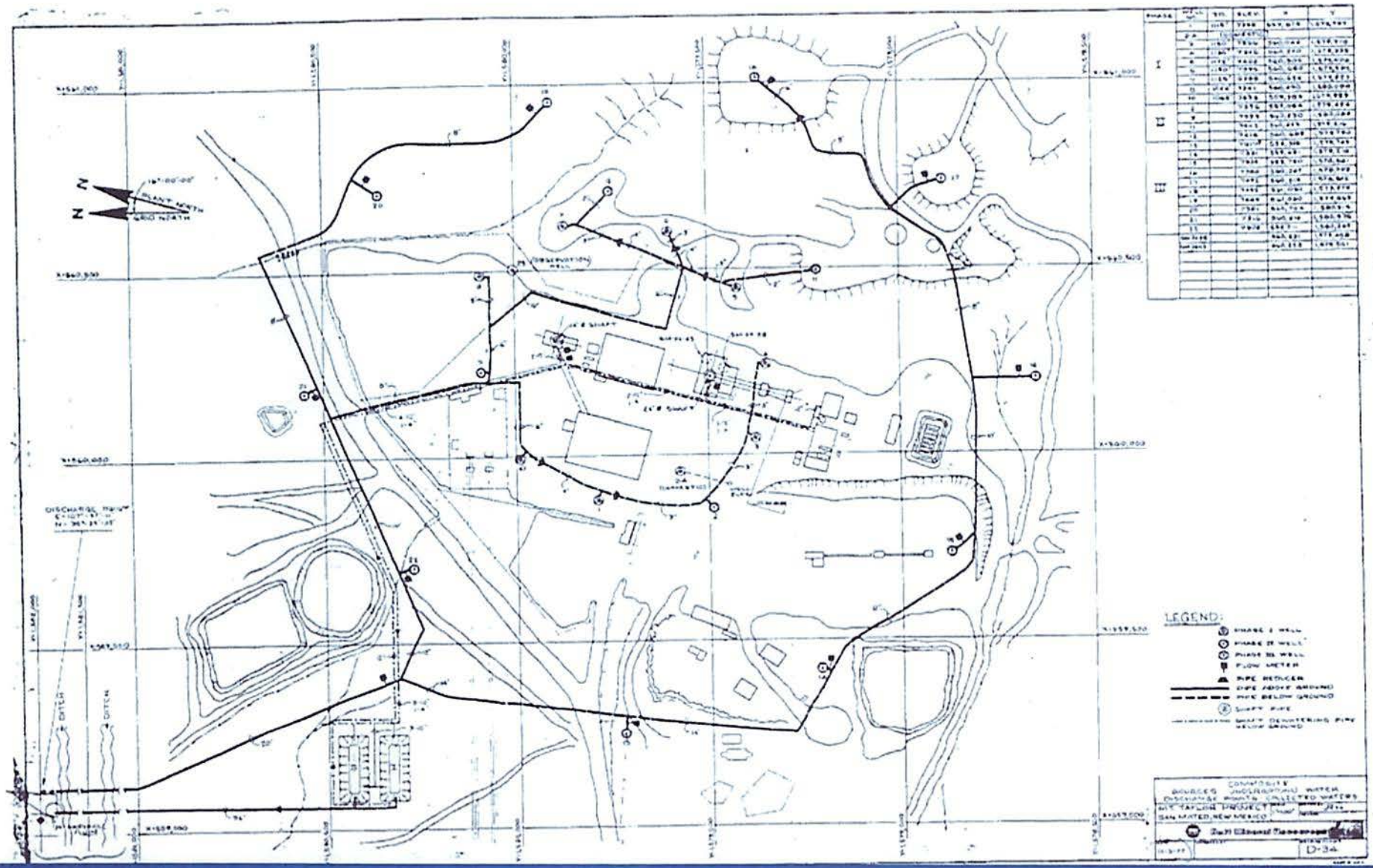
Mount Taylor
Underground Water Collection and Discharge Points

DESIGN LOCATIONS OF DEPRESSURIZING WELLS



PHASE I WELLS: 1, 2A, 3, 4, 5, 6, 7, 8, 10
PHASE II WELLS: 2, 9, 11, 12
PHASE III WELLS: 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, SM 24-43

Mount Taylor
Underground Water Collection and Discharge Points



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Deep Well Chronology – Phase I, II, III Wells

PHASE I WELLS (in Pt. Lookout aquifer)

- #2A, 6, 7, and 8 – domestic wells, pumping from August 1971 to present
- All other wells – pumping began December 1976; pumping ended March 1977

BENEFICIAL USE

PHASE II (in Dakota aquifer)

- Pumping began between February 1977 and April 1977; pumping ended February 1978
- Water discharged to San Mateo Creek until February 1978, then to San Lucas Canyon in Rio Puerco Basin, part of the Rio Grande Underground Water Basin (not within the San Mateo Creek Basin) via a ~4 mile pipeline

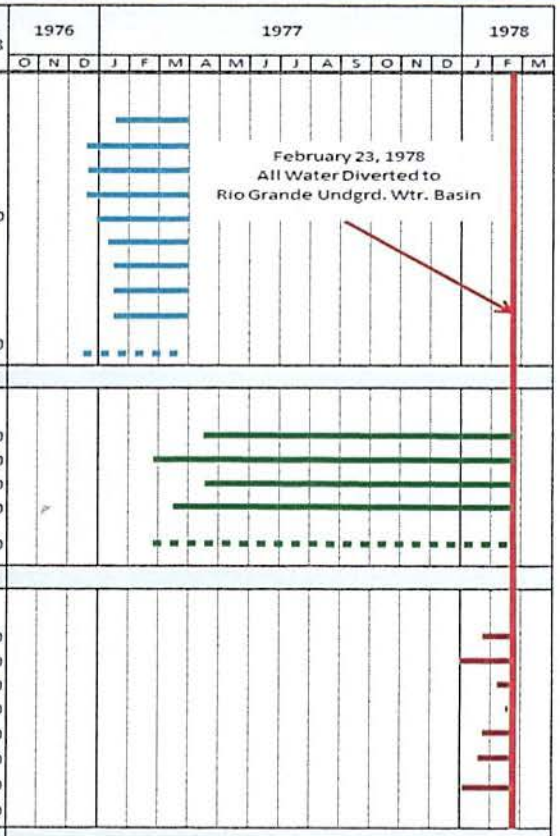
PHASE III (in Westwater aquifer)

- Well #SM24-43 began pumping late 1977; pumping ended December 1978
- Other wells began pumping January 1978
- Water discharged to San Mateo Creek until February 23rd, 1978, then to San Lucas Canyon

Total time of discharges to San Mateo Creek – 13 months

Mount Taylor Mine
Phase I, II and III Dewatering Chronology
Water Production to San Mateo Creek Basin (SMCB)

Description	Aquifer	Pumping Start	Service Date	Days	Depth (Ft.)	Pump Capacity (gpm)	Production Prior to 2/22/78 (gallons)
Phase I Wells							
#1	PT. LOOKOUT	1/14/1977	3/31/1977	76	1,118		
#2A*		12/18/1976	*		925		
#3		12/18/1976	3/31/1977	103	1,150		
#4		12/19/1976	3/31/1977	102	1,130		
#5		12/29/1976	3/31/1977	92	1,172	850	126,072,000
#6		1/9/1977	3/31/1977	81	1,190		
#7		1/16/1977	3/31/1977	74	1,125		
#8		1/18/1977	3/31/1977	72	1,044		
#10		1/14/1977	3/31/1977	76	1,065		
Shaft/Mine Water		12/18/1976	3/31/1977	103		600	88,992,000
Pt. Lookout / Sub-total							215,064,000
Phase II Wells							
#2	DAKOTA	4/15/1977	2/23/1978	314	2,920	300	9,425,800
#9		2/25/1977	2/23/1978	363	2,845	300	26,087,400
#11		4/15/1977	2/23/1978	314	3,028	500	53,673,600
#12		3/15/1977	2/23/1978	345	2,940	300	13,429,400
Shaft/Mine Water		2/28/1977	2/23/1978	360	2,853	600	311,040,000
Dakota / Sub-total							413,656,200
Phase III Wells							
#13	WEST WATER	1/27/1978	2/23/1978	27	3,185	700	35,833,000
#14		1/1/1978	2/23/1978	53	3,205	700	20,160,500
#15		2/8/1978	2/23/1978	15	3,205	700	13,652,900
#16		2/21/1978	2/23/1978	2	3,275	700	4,146,700
#17		1/24/1978	2/23/1978	30	3,342	700	27,274,800
#18		1/19/1978	2/23/1978	35	3,314	700	37,906,100
SM24-43**		1/1/1978	**		3,535	500	38,160,000
Shaft/Mine Water				0			0
Westwater / Sub-total							177,134,000
Total Volume of Water Produced							805,854,200



Notes:

1) Total volume of water produced (805,854,200 gals.) was not reduced to account for consumptive use, i.e., concreting, dust suppression, domestic use, wash-down, drill water, etc.
2) All water produced (less comsumptive use) was discharged into SMCB up until 2/23/78.
3) EPA Report dated 30 August 2016 stated that "*collectively, more than 150 billion gallons of water was pumped in the Grant Mineral District between 1956 and 1982*". Based on water volume discharge into SMCB, Mt Taylor's contribution is ~0.5%.
4) * Water Well 2A is a domestic well that remains operational today, however, it was used as a depressurization well during the period.
5) ** Monitor Well SM24-43 was also used as a depressurization well during the period.
6) The bottom of the 24' production shaft had been sunk ~2,775 ft. below surface grade on 2/23/78, ~415 ft. above the Westwater Formation located 3,190 ft. below surface grade.
7) The bottom of the 14' service shaft had been sunk ~2,853 ft. below surface grade on 2/23/78, ~337 ft. above the Westwater Formation located 3,190 ft. below surface grade.

Water Chemistry in Dewatering Wells and Mine Shafts, 1977-February 1978 (mg/L)

Description	Avg. U	Avg. Se	Avg. Mo
Phase II Wells	0.005	<0.01	<0.05
Phase III Wells	<0.005	<0.01	<0.05
Mine Water	0.02	<0.01	<0.05

Change from SMCB to RG Basin

Note:

November 10, 1977, NPDES Gulf Oil Corporation's Application for Permit to Discharge Wastewater, Line 26, Item 16 Additional Information, Table I.

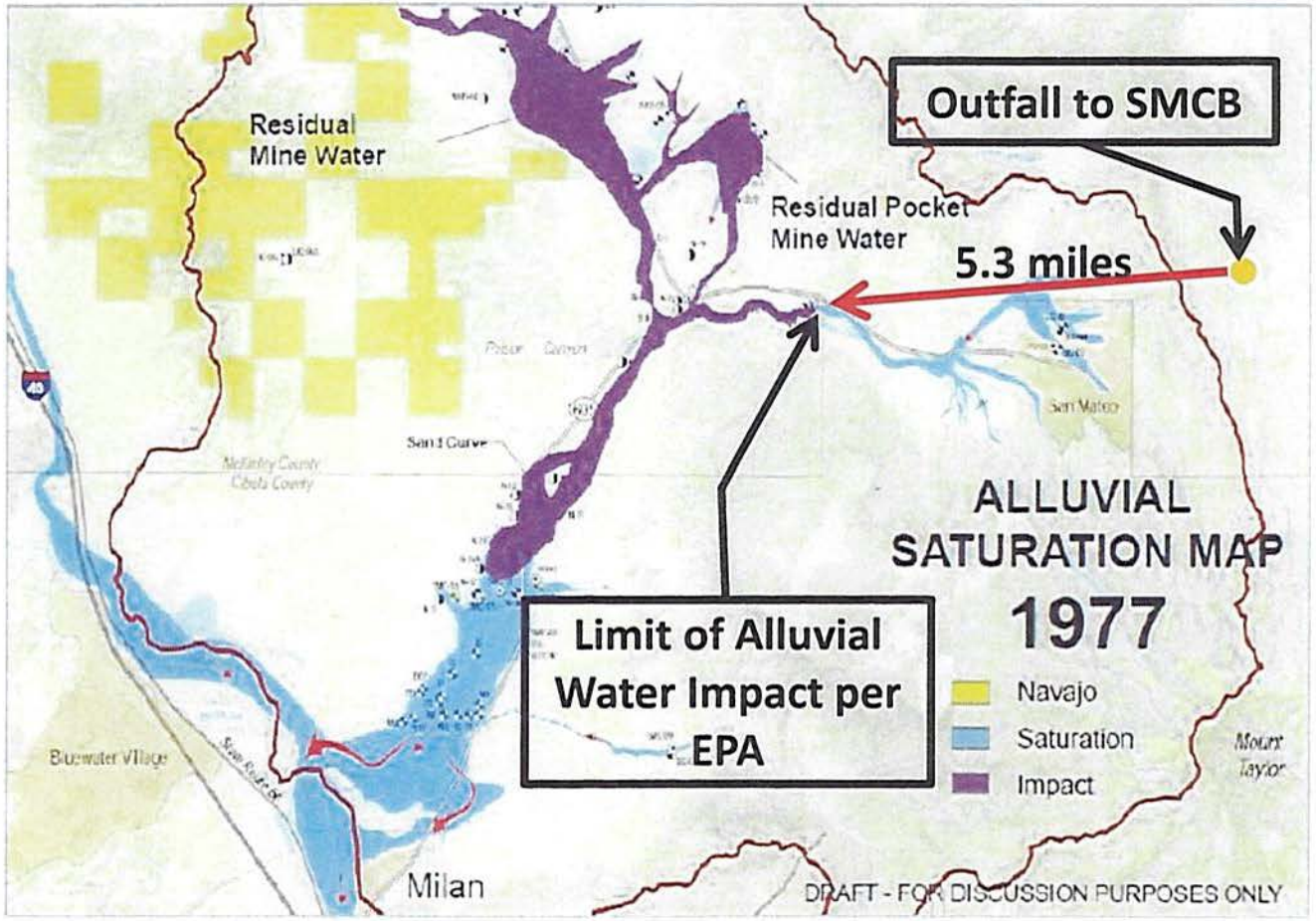
EPA Water Quality Comparisons

Description	U mg/l	Se mg/l	Mo mg/l
Upper SMCB Background Water Quality 1978 - 1980, EPA	0.005 - 0.010	0.005	0.005 - 0.010
EPA Wells BG-03, BG-04 & BG-05 (most recent data)	0.0024 - 0.012	0.021	not provided
Current EPA/New Mexico Water Quality Standards	0.03	0.05	1

EPA DATA

(With labels added by RGR)

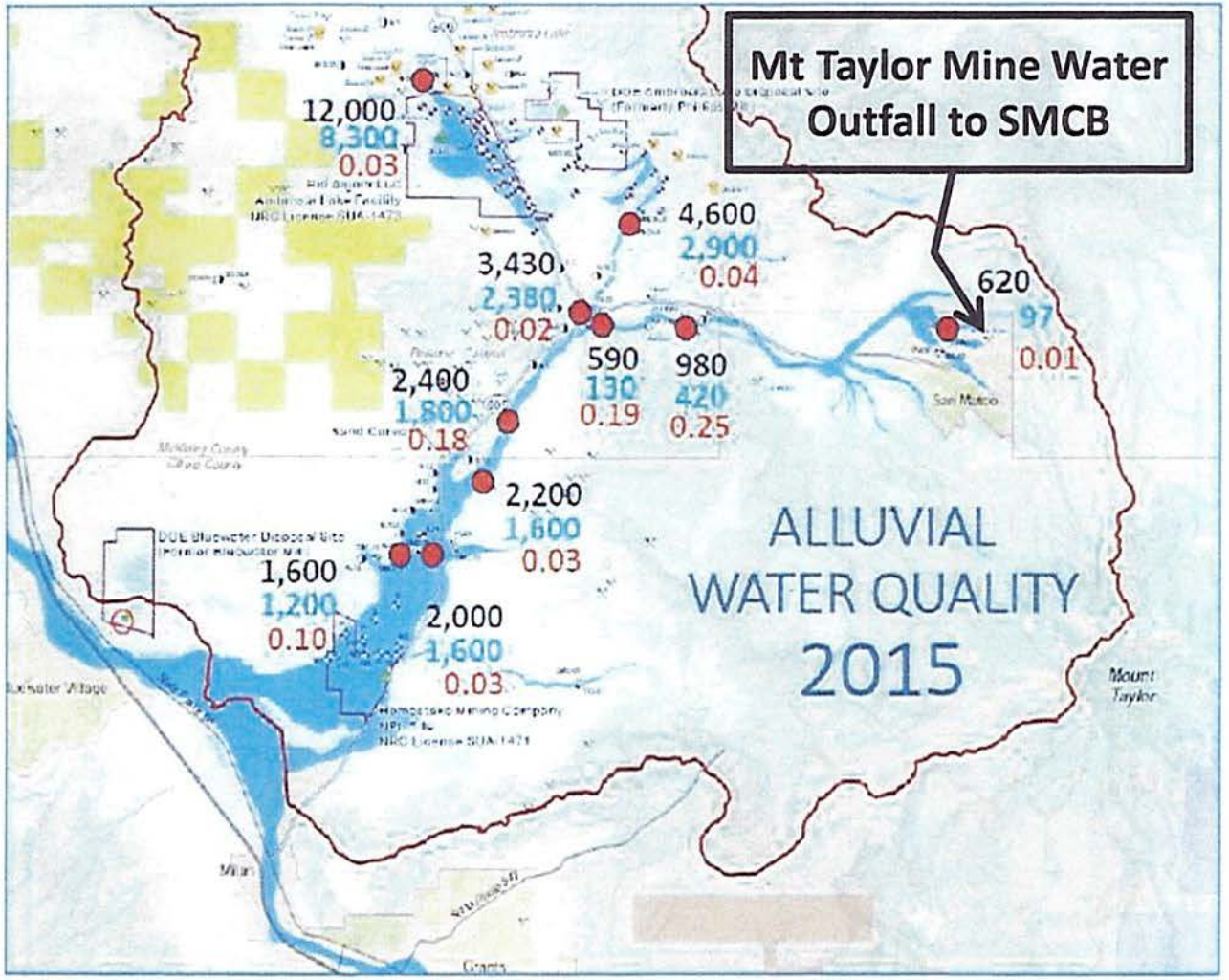
Ground Water Impact to SMCB Prior to MTM Westwater Discharge



Slide #4 from SMCB Information Meeting Presentation 3/16/18

WELLS SAMPLED BY EPA

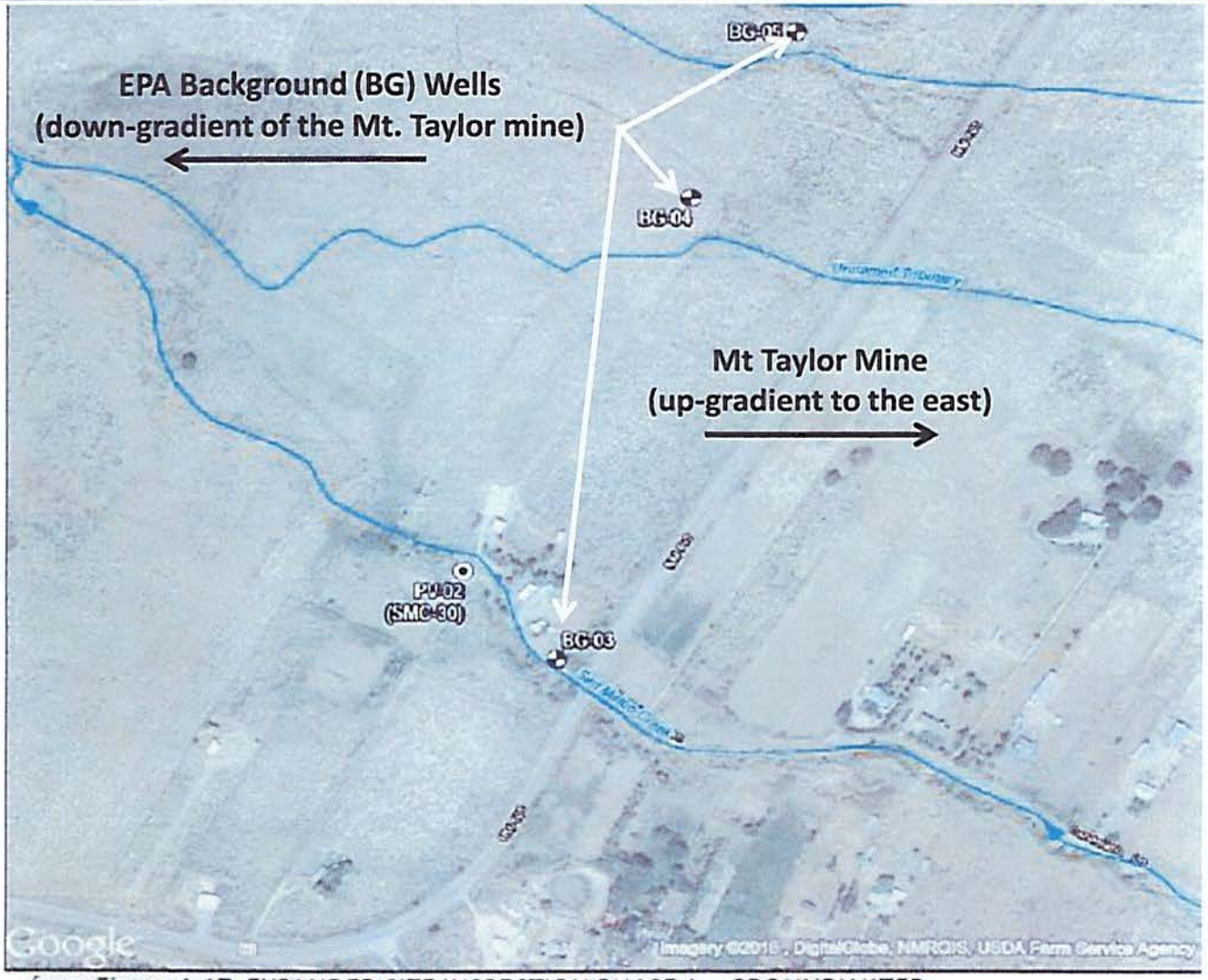
2,900 TDS
130 Sulfate
0.25 Uranium



Draft – For Discussion Purposes Only

Slide 22, San Mateo Creek Basin Ground Water Study, Superfund National Radiation Training Workshop, Sacramento, CA April 5, 2018

BACKGROUND WELL LOCATIONS



from Figure 4-17, EXPANDED SITE INSPECTION PHASE 1 – GROUNDWATER INVESTIGATION REPORT, 30 August 2016

Table 6-2
Alluvial Ground Water Results
EPA Monitoring Wells Down-gradient of the Mount Taylor Mine
San Mateo Creek Basin Uranium Legacy Site
Cibola and McKinley Counties, New Mexico

Analyte	BG-03	BG-04	BG-05	April 1978 to Oct 1980 SMC Upland Alluvial Groundwater (Lee-1 and Lee-2 Wells)
Sulfate (mg/L)	76	22	13	5-20
Total Uranium (mg/L)	0.0027JQ	0.004JQ	0.016	0.005-0.010[a]
Total Dissolved Solids (mg/L)	620	350	310	125-300
Total Radium (Ra-226 + Ra-228 pCi/L)	4.74	4.98	0.49	0.05-0.33[b]
Gross Alpha (pCi/L)	51G	18.2G	13.5 G	2.5-15.0
Total Selenium (mg/L)	0.021U	0.023JQ	0.021U	0.005-0.005

The results from BG-03, BG-04, and BG-05 show total uranium concentrations ranged from 0.0027 mg/L to 0.016 mg/L. These values represent some of the lowest concentrations for total uranium measured in alluvial groundwater anywhere in the SMC Basin and are below the EPA MCL of 0.030 mg/L. The combined Radium-226 + Radium-228 levels detected at BG-03 (4.74 pCi/L) and BG-04 (4.98 pCi/L) were an order of magnitude above that at BG-05 (0.49 pCi/L), but all three were below the federal MCL of 5.0 pCi/L.